

IN THE CLAIMS

The current set of claims is shown below.

1. (Currently amended) A method of stabilizing an operating wavelength of a laser, comprising:

illuminating an optical element with light output from the laser to produce an interference pattern, the optical element being a non-parallel etalon, the interference pattern arising from interference between optical surfaces of the etalon that are not parallel to each other, the interference pattern being reflected by the optical element to a detector unit;

detecting at least three different portions of the interference pattern with at least three detector elements of the detector unit ~~to generate at least three respective detection signals, and with at least three respective additional detector elements, the additional detector elements detecting phase portions of the interference pattern corresponding to the phase positions of the interference pattern detected by the at least three detector elements;~~

~~summing signals from each of the at least three detector elements with signals from their respective additional detection elements to produce at least three detection signals;~~

generating a feedback signal using the at least three detection signals; and
adjusting the operating wavelength of the laser in response to the feedback signal.

2. (canceled)

3. (Original) A method as recited in claim 1, further comprising detecting movement of intensity peaks of the interference pattern as the operating wavelength changes.

4. (Original) A method as recited in claim 1, further comprising illuminating at least three detector elements of a detector unit with the interference pattern, wherein the interference pattern has a period P and the at least three detector elements are spaced apart by approximately $mP + kP/n$, where k and m are integers and n is the number of detector elements.

5. (previously presented) A method as recited in claim 4, wherein the at least three detector elements are spaced apart by P/n .

6. (canceled)

7. (canceled)

8. (Original) A method as recited in claim 1, further comprising summing the at least three detection signals to produce a signal indicative of a power level of the laser.

9. (Original) A method as recited in claim 1, further comprising compensating the detection signals for a light intensity distribution function.

10. (Original) A method as recited in claim 1, further comprising generating phase signals using the detection signals and wherein generating the feedback signal includes generating the feedback signal using the phase signals.

11. (Original) A method as recited in claim 10, wherein there are three detection signals designated R, S, and T, corresponding to three detector elements, and further comprising generating a power signal, $I = (R+S+T)/3$, indicative of laser power.

12. (Original) A method as recited in claim 11, wherein generating the phase signals includes generating a sine signal, $\sin(\phi) = (T-R)/(I\sqrt{3})$, a cosine signal, $\cosine(\phi) = (S-I)/I$ and a phase signal $\phi = \arctangent((\sin(\phi))/(\cos(\phi)))$.

13. (Original) A method as recited in claim 12, further comprising illuminating the non-parallel etalon with light of a known wavelength and measuring standard detection signals R_0 , S_0 and T_0 for the three detector elements respectively, generating a standard power signal $I_0 = (R_0+S_0+T_0)/3$ and generating a standard sine signal, $\sin(\phi_0) = (T_0-R_0)/(I_0\sqrt{3})$, a standard cosine signal, $\cosine(\phi_0) = (S_0-I_0)/I_0$ and a standard phase signal $\phi_0 = \arctangent((\sin(\phi_0))/(\cos(\phi_0)))$.

14. (Original) A method as recited in claim 13, further comprising generating a transformed sine signal, $\sin(\varphi') = -\sin(\varphi_0) \cos(\varphi) + \cos(\varphi_0) \sin(\varphi)$, a transformed cosine signal, $\cos(\varphi') = \cos(\varphi_0) \cos(\varphi) + \sin(\varphi_0) \sin(\varphi)$, and a transformed phase signal, $\varphi' = \tan^{-1}(\sin(\varphi')/\cos(\varphi'))$.

15. (Original) A method as recited in claim 14, wherein the feedback signal is the transformed phase signal.

16. (Original) A method as recited in claim 14, wherein the feedback signal is the transformed sine signal.

17. (Canceled)

18. (Original) A method as recited in claim 1, further comprising stabilizing the operating wavelength to one of a number of ITU standard optical communications wavelengths.

19. (currently amended) A system for stabilizing an operating wavelength of a laser, comprising:

means for illuminating a non-parallel etalon with light output from the laser to produce an interference pattern from non-parallel surfaces of the non-parallel etalon;

means for detecting at least three different portions of the interference pattern and at least three respective additional portions of the interference pattern, the additional portions of the interference pattern corresponding respectively to the phase positions of the at least three different portions of the interference pattern, ~~to generate at least three respective detection signals,~~ the non-parallel etalon reflecting the interference pattern towards the means for detecting ~~the at least three different portions of the interference pattern;~~

means for summing signals from each of the at least three different portions of the interference pattern with respective signals from the at least three additional portions of the interference pattern to produce at least three detection signals;

means for generating a feedback signal using the at least three detection signals;
and

means for adjusting the operating wavelength of the laser in response to the feedback signal.

20. (previously presented) A method of monitoring light output by a laser, comprising:
producing a periodic optical interference pattern by illuminating an optical element with the light output by the laser;
detecting at least three different portions of the periodic optical interference pattern to generate at least three respective detection signals;
generating a power signal indicative of output power from the laser using the at least three detection signals; and
stabilizing the wavelength of the light output by the laser using the at least three detection signals.

21. (Original) A method as recited in claim 20, wherein producing the periodic optical interference pattern includes illuminating a non-parallel etalon with the light output by the laser.

22. (Original) A method as recited in claim 20, further comprising detecting movement of intensity peaks of the interference pattern as the operating wavelength changes.

23. (Previously presented) A method as recited in claim 20, wherein the optical element is a wedge etalon having substantially planar surfaces.

24. (Previously presented) A method as recited in claim 20, wherein the optical element is a non-parallel etalon having at least one curved surface.

25. (Original) A method as recited in claim 20, wherein producing the periodic optical interference pattern includes reflecting at least a portion of the light produced by the laser off the optical element.

26. (Original) A method as recited in claim 20, wherein detecting the at least three different portions of the periodic optical interference pattern includes providing at least three detector elements at respectively different phase portions of the periodic optical interference

pattern, the different phase portions of the periodic optical interference pattern corresponding to evenly spaced portions of a period of the periodic optical interference pattern.

27. (Original) A method as recited in claim 20, wherein generating the power signal includes adding the at least three detection signals.

28. (previously presented) A method as recited in claim 20, further comprising generating a feedback signal using the at least three detection signals and stabilizing the wavelength of the light output from the laser comprises stabilizing the wavelength using the feedback signal.

29. (previously presented) A system for monitoring light output by a laser, comprising:
means for producing a periodic optical interference pattern;
means for detecting at least three different portions of the periodic optical interference pattern to generate at least three respective detection signals;
means for generating a power signal indicative of output power from the laser using the at least three detection signals; and
means for stabilizing the wavelength of the light output by the laser using the at least three detection signals.